Respiratory Protection Newsletter April 2021

Featured Courses:

Respirator Selection & Cartridge Change Out Schedules: May 18-19, 2021 **Registration Closed**
Fit Testing Refresher & Advanced Topics: May 20, 2021 **Registration Closed**

In the this issue:

Let's Think About This:

Un-reliable Respirator/Mask Research

Singe versus Double Masking

It's time to **STOP** the nonsense.

Nearly every day I read about respirators or respiratory protection. At times, the amount of information can be overwhelming and confusing, especially when the studies are poorly designed. Some of these articles are published in highly respected journals representing the fields of aerosols, fluid dynamics, toxicology, medicine, occupational medicine, infection control, industrial hygiene, etc. Unfortunately, you can no longer judge the quality of the study by the reputation of the journal or the institution that conducted the study. Since the pandemic, it seems anyone who's purchased fit testing equipment is compelled to publish their results. They feel their data is unique, often because they're unfamiliar with the science of respiratory protection. There are so many poor studies, it's difficult to nearly impossible to trust what you read. Information about respirators and face masks is of interest to the public. Consequently, the news media picks it up and distributes the information to an even larger audience. In some cases, the flaws are identified and corrected, but few people are aware of the corrections. In other cases, the data and/or conclusions are so distorted, the article is retracted. Some articles remain unchanged, for others to believe as reliable and accurate.

For example, an April 2021 "Research Letter" in ***JAMA Internal Medicine*** reported a mean increase in fitted filtration efficiency (FFE) when human volunteers switched from a single mask (55%) to a double mask (66%). They concluded: "double masking improves FFE". In other words, two masks are better than one??? This study was partially funded by the Centers of Disease Control (CDC) and was used to update CDC face covering guidelines.

Here's my perspective. In this article, the authors used the word "fitted" and the study was not designed to evaluate source control. So, let's look at this study from a respiratory protection perspective. The study included just three (3) subjects. Using three subjects is inadequate to compare fitting characteristics. Factors that determine the capability of a facepiece or mask to fit a population of wearers include, face shape, face size, race/ethnicity, gender, extent of training, donning technique, etc. Three (3) subjects is inadequate to address these factors. More of this will be mentioned below.

The authors also expressed their results as: "fitted filtration efficiency" (FFE). Since few people are familiar with this terminology, I re-calculated their data to express results as fit factors, a term more commonly used with respiratory protection. The reported fitted filtering efficiency values of 55% and 66%, are equivalent to **fit factors of 2 and 3**, respectively. This means both conditions (single & double masking) had **excessive inward leakage**. These values are **far** below the OSHA minimum fit factor of 100 for an N95 filtering facepiece respirator. In other words, there was no practical difference between the two tested conditions and they did **not** offer significant protection to the wearer. When something fits this badly in a laboratory, imagine how it would perform in the real world. Did the researchers evaluate consistency in donning a double mask? The answer is **No**. I've conducted lots of fit testing with single and double layers of surgical masks and other facepieces. Donning these consistently is a nightmare. Even the process of probing a double

facepiece can influence positioning and fit.

The facial features of these three (3) subjects are not known. The authors reported head circumferences of 56.0, 58.5, and 55.9 cm. This would be useful information if I wanted to purchase a baseball hat for these subjects online, but doesn't provide information about face size or shape. Study subjects should have facial measurements taken and compared to a representative population of potential wearers, such as the one specified in ASTM Standard Method F3407, which uses a NIOSH bivariate anthropometric panel representing approximately 98% of a U.S. population. At the very least, when the requirements of a representative bivariate panel are not met, the number of subjects within each cell, and cell number (which identifies face size measurements), should be reported.

Did this study evaluate the effect of increased breathing resistance of double masking and whether or not a general population of users would consistently wear double masks correctly? The answer is **No**.

The illusion of greater protection with double masking may cause a false sense of security with potential for wearers to increase time and proximity (decreased distancing) around an infected person. In addition, the increase in breathing resistance may cause repositioning or even removal of the mask resulting in additional face seal leakage. With so many different styles and materials of masks available, it's unpredictable which models would be used. When combined with unpredictable filtration and fitting characteristics, double masking becomes an unreliable recommendation and doesn't make sense at this point in time.

Another study compared the fitting characteristics of N95 and KN95 filtering facepieces, with just three (3) people. It appears some researchers believe three (3) subjects is the standard for comparing respirators and face masks. In the absence of having a representative panel of test subjects, the conclusions are not useable.

In many cases, it's impossible to understand what type of respirator or model was even studied. Here's an example from a different 2021 article, where the author said:

> "Multiple groups have now demonstrated that barrier face coverings and masks can help slow the spread of SARS-CoV-2."

What is a "mask"? Do they mean a "surgical mask" or something else? Perhaps this will become clearer, as we read further.

> "In this study, a model 8511 mask and a model 8210 mask (3M) were used."

Apparently, they're identifying 3M models 8511 and 8210 as "masks", rather than N95 filtering facepiece respirators. In that case, I wonder what the previous sentence was referring to when they wrote "barrier face coverings and masks"?

There are thousands of different make and model respirators, surgical masks, and barrier face coverings. Results for one model, often don't apply to another. Therefore, at a minimum, it's important to know what make or model respirator or facepiece was tested.

Elsewhere I've read:

> "This work demonstrates the qualitative fluid flow characteristics of a standard N95 respirator with and without an exhalation valve."

What is a "standard" N95 respirator?

Is this an N95 filtering facepiece respirator?

Is it an elastomeric half facepiece with N95 filters?

Is it an elastomeric full facepiece with N95 filters?

In this particular case the author eventually clarified the specific make and model respirators used. But, this is not always the case.

Another highly cited article from one of the most recognizable medical journals in the world compared the fitting characteristics of an FDA surgical mask, and various types of fabric face coverings to that of a single N95 filtering facepiece respirator. This article then ranked how well each category fits potential wearers. However, all of the testing was conducted on a **single** person. Consequently, the results only apply to the person tested and not anyone else.

Too many "researchers" with bad study designs are given free money from taxpayers. They use this money to buy instrumentation and may be clueless regarding how to use the instrument properly, design a study, and/or interpret results. The results are published and everyone believes its truthful because it comes from a well-known medical center or university. Once published, the researchers achieve greater notoriety, making it easier to get more money. Pilot studies should have strong statements regarding study limitations. Conclusions should be carefully written to ensure the results do not extend beyond the weaknesses and limitations of the study. Pilot studies do have an important role and can be used to support

the need for additional research. However, results from pilot studies should be presented at scientific meetings where others can critique study design, results, limitations, and conclusions. They should rarely be published.

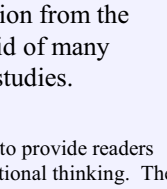
This nonsense must be stopped.

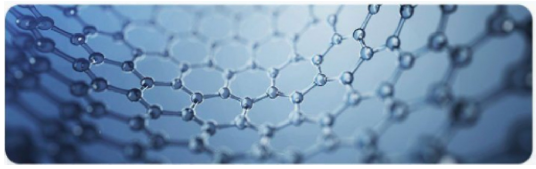
Bad studies don't contribute to our knowledge base, they confuse and distort it. The studies I selected for this column are **not** the worse I've seen. They just happen to be the ones still sitting on my desk. Initially, the article on Graphine was my lead story, but I felt compelled to change the order. We often make fun of people getting information from the "internet". Now the same can be said of many published respirator and face mask studies.

Note: "Let's Think About This" is intended to provide readers information "outside the box" of traditional thinking. The content may at times be funny, light-hearted, spirited or identify unusual observations. It's tongue and cheek and does not necessarily represent the views of Dr. McKay.

Face Masks with Health Risks Recalled

On April 2, 2021, Health Canada issued a public safety **recall** and is advising Canadians not to use face masks containing graphene or material known as Biomass Graphene". They're concerned wearers could inhale graphene particles, which may pose health risks. Graphene is a nanomaterial consisting of a single layer of carbon atoms arranged into a two-dimensional honeycomb lattice and reported to have anti-viral and anti-bacterial properties. Health Canada's preliminary investigations reveal that inhaled graphene particles have potential to cause early lung toxicity in animals. They also report that the potential for people to inhale graphene particles from face masks and the related health risks are not yet fully known. Risk may vary based upon mask design and manufacturing process. The amount, duration of exposure, type, and characteristics of the graphene material used, can affect the potential to inhale particles and associated health risks.





2-Dimensional Structure of Graphene

Health Canada is aware that masks containing graphene have been sold with COVID-19 claims and used by adults and children in schools and day care centers. Health Canada believes graphene masks may also have been distributed for use in health care settings. Health Canada has directed all known distributors, importers and manufacturers to stop selling and to recall the affected products.

Dr. McKay's Comment: I suspect the biggest concern regarding graphene release would be using these products with children, persons with pre-existing lung disease, immuno-compromised individuals, etc.. Unfortunately, the recall notice doesn't specifically provide measurable data that graphene particles are released and subsequently inhaled from face masks. The recall appears to be based upon consumer complaints, which should not be ignored. However, factors affecting particle release was not provided. Data also wasn't provided regarding the amount of graphene potentially inhaled or particle size. As a pulmonary toxicologist, specializing in respiratory protection, I'd like to have this information. Keep in mind other anti-microbial agents such as silver and copper have been incorporated into face masks, respirators, and other fabrics. Therefore, the term "anti-microbial" doesn't specifically mean that graphene is or is not used. One concern when used in face masks and respirators, versus clothing, is proximity to the face. Particle released inside face masks and respirators have greater likelihood to be inhaled. Although I haven't seen any data, the Health Canada recall doesn't mention if the concern involves more than one make or model face mask. There are different ways to incorporate a layer of graphene into a mask or respirator and different manufacturing processes can be used. If this is an issue for a single model, then other models may not be a concern.

For details and to read the Health Canada report, use the following link or simply click here

https://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2021/75309a-eng.php

To contact Health Canada, call:
(613) 957-2991
1-866-225-0709
or email: hcinfo.infosc@canada.ca

Graphene Council Response to Health Canada

In response to Health Canada's recall of graphene masks, the Graphene Council issued a reply on April 9th. Click Here for Response

The Graphene Council expressed an interest in working with Health Canada to co-ordinate their efforts and get a better understanding of the specific product at the center of this issue. The Graphene Council believes the issue could be related to a specific product and not necessarily apply to all graphene containing masks. They express concern that a product recall typically relates to a specific manufacturer, product, or lot number and not to all manufacturers of graphene masks.

According to the Graphene Council's response, they wrote:

> "Based on public reporting, the face mask in question is product number #SNN200642 produced by the Shengquan or SQ Group (http://e.shengquan.com) based in Zhangqiu City, China and refers to its material as "Biomass Graphene"."

Below is a photo of the suspected mask provided with the Graphene Council's response.

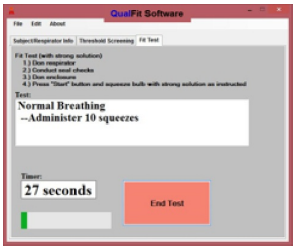
I've researched this particular product and identified the mask as a multi-layered product with the "graphene" positioned as the outer most, inside layer, as having contact with the wearers face. If positioned elsewhere, such as a middle layer, particle release would be less substantial.

Often it's difficult for a consumer to know the composition of materials used in face masks and respirators. The **good news** is manufacturers claiming anti-bacterial or anti-viral properties, typically identify what they use. In this case, the words "Graphene" or Biomass Graphene" are typically displayed on the box or product literature.

Translated Respirator Medical Questionnaire
The Washington State Labor and Industries Division of Occupational Safety & Health has translated the OSHA respirator medical clearance questionnaire into 11 languages. You can access it from their coronavirus website at:
https://lni.wa.gov/safety-health/safety-topics/topics/coronavirus#general-information
or, just click here.

An easier, more accurate way to administer qualitative respirator fit testing using sweet or bitter methods.

QualFit software automates and records qualitative respirator fit testing using Saccharin and/or Bitrex aerosol solutions. The software prompts the operator to deliver the aerosol solution with the correct number of squeezes for each exercise, at the proper time, and in the proper order. This improves fit testing accuracy. The software displays the current exercise in progress, automates the timing sequence and calculates the number of squeezes to be administered, based on threshold screening results. Visual and audible prompts allow the operator to focus their attention on the respirator wearer. The entire procedure becomes less frustrating for the operator and subject being tested. The software tracks each step of the fit testing procedure required in mandatory Appendix A of the OSHA Respirator Standard. **QualFit** software improves the quality and efficiency of respirator fit testing. The employer benefits by knowing the test procedure was properly administered and provides written documentation for compliance with record keeping requirements specified in paragraph "m" of the OSHA standard. The employee benefits by knowing a standardized procedure was followed, rather than what often appears to be a random procedure.



For Information visit: www.QualFit.net
To place a secure online credit card order visit:
https://qualfit-software.square.site/

FDA: Transition Away N95 FFR Decontamination

On April 9, the U.S. Food and Drug Administration (FDA) released a recommendation to health care personnel and facilities suggesting they transition away from crisis capacity conservation strategies, such as decontaminating disposable respirators for reuse. Based on the increased domestic supply of new respirators approved by NIOSH, the FDA believes there is adequate supply of respirators to transition away from use of decontamination systems.

Specific FDA recommendations are:

> Limit decontamination of disposable respirators. Decontaminated respirators and respirators that have undergone bioburden reduction should be used only when there are insufficient supplies of new FFRs or if you are unable to obtain any new respirators.
>
> Transition away from a crisis capacity strategy for respirators, such as decontamination of N95 and other FFRs.
>
> Increase inventory of available NIOSH-approved respirators—including N95s and other FFRs, elastomeric respirators, including new elastomeric respirators without an exhalation valve that can be used in the operating room, and powered air-purifying respirators (PAPRs). Even if you are unable to obtain the respirator model that you would prefer, the FDA recommends that you obtain and use a new respirator before decontaminating or bioburden reducing a preferred disposable respirator.

To see the news release copy and paste the URL below or click here:

https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-april-9-2021?utm_medium=email&utm_source=govdelivery

Spirometry Refresher:

May 11, 2021 **(1 spot remaining)**

September 21, 2021

Interpretation of Spirometry: Beyond the Numbers
September 22, 2021

Go to www.DrMcKay.com for details.

Fit Testing Refresher & Advanced Topics

This 1-day course is specifically designed for the person who has been conducting fit testing, but needs a better understanding as to why poorly fitting respirators pass can pass a fit test and why good fitting respirators fail. This class provides an opportunity to discuss advanced topics not covered during a typical 2-day fit testing workshop due to time limitations. This course is also valuable for respirator program administrators who need a better understanding of fit testing procedures and assurance that their fit testing program is being run properly. **This program identifies tricks and omissions some fit test operators use to allow poorly fitting respirators to pass fit testing (QLFT & QNFT)**.

2022 Course date to be determined in Cincinnati

OSHA News

How OSHA Protects It's Workers

Ever wonder how OSHA protects its employees? As part of the March 12, 2021 National Emphasis Program (NEP) developed for COVID-19, OSHA released a document describing how it will keep Compliance Safety and Health Officers (CHSOs) safe during onsite inspections.

The NEP will target workplaces that have workers with the highest potential exposure to COVID-19 in industry sectors of general industry, construction, agriculture, and shipyards. The industries include, but are not limited to, healthcare and critical infrastructure such as meat and poultry processing, and some high-volume retail settings. Businesses will be randomly selected from among the targeting lists. With respect to respiratory protection, here's how OSHA plans to keep its own employees safe:

> "When on-site inspections are conducted, the risk is evaluated and appropriate protective measures are utilized. OSHA ensures that CSHOs have needed equipment and supplies, including decontamination supplies for cleaning any equipment and materials brought on site. CSHOs are also equipped with necessary Personal Protective Equipment (PPE), such as appropriate respiratory protection, goggles or face shields, disposable gloves, and disposable gowns or coveralls of appropriate size."

The minimum level of respiratory protection for CSHOs involved in COVID-19 related inspections is a fit-tested half-mask elastomeric respirator with an N95-rated filter. CSHOs may also opt to use a fit-tested N95 rated Filtering Facepiece Respirator (FFR), which permits staff to employ protective measures based on site-specific circumstances. CSHOs on non-COVID-19 inspections must, at a minimum, wear a 2 layer cloth face covering or surgical mask. CSHOs on non-COVID-19 inspections have the option of using a fit-tested half-mask elastomeric respirator with an N95-rated filter or a fit-tested FFR."

Interestingly, the document addresses protection of its employees with "a fit-tested half-mask elastomeric respirator with an N95-rated filter", but doesn't address source control for the protection of others with whom OSHA CSHOs may encounter.

OSHA Cites Auto Body Manufacturer

April 2021: OSHA announced it cited an auto body manufacturer for 2 willful and 10 serious safety and health violations and is seeking $393,992 in fines. The citation is in response to an inspection on October 1, 2020, following a complaint to OSHA.

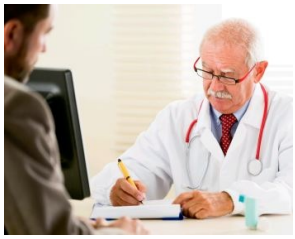
The agency cited the manufacturer with willful, serious violations of the fall protection and noise standards. In addition, there were 10 serious safety & health violations, including:

Respiratory Protection Standard:

Failing to develop and implement a respiratory protection program requiring employees to wear N95 respirators and full air-supplying hoods while applying powder coating and bead blasting;

Failing to provide medical evaluation to determine employees' ability to wear a respirator;
Failing to perform qualitative fit testing of respirators;
Lack of respirator training;
Improper storage of respirators; and
An employee with facial hair that came between his face and the sealing surface of the facepiece of a half-face, air-purifying respirator.

Medical Complications from Respirator Use



OSHA requires respirator medical clearance for persons required to wear respiratory protection. Researchers at the University of Cincinnati are collecting information on persons who:

1) Developed a medical complication while wearing a respirator, and
2) Identify pre-existing medical conditions causally related to the complication that developed.

If you have information (published or un-published) that establishes a link between a specific medical condition and a complication that developed as a result from wearing a respirator or during fit testing, please share this information with us. We're particularly interested in cases where a medical complication was induced by respirator use. Information such as the specific type of respirator worn, work environment, duration of use, level of physical exertion, underlying medical conditions that contributed to the complication, etc., is needed. You can send this information to:
info@DrMcKay.com

2021 McKay Publications

S Grinshpun, H Haruta, R Eninger, T Reponen, R T **McKay** & Shu-An Lee (2021)
Eficacia de la mascarilla facial con filtro de partículas N95 y de la mascarilla quirúrgica durante la respiración humana: dos vías para la penetración de partículas, *Journal of Occupational and Environmental Hygiene*, 18:sup1, S1-S14, 2021
DOI:10.1080/15459624.2021.1877051

X He, T Reponen, R **McKay** & S Grinshpun (2021)
¿Cómo afecta la frecuencia respiratoria el desempeño de una mascarilla respiratoria autofiltrante N95 yde una mascarilla quirúrgica contra sustitutos de partículas virales?, *Journal of Occupational and Environmental Hygiene*, 18:sup1, S15-S24, 2021
DOI: 10.1080/15459624.2021.1877069

Wanted: Damaged Fit Test Adapters

Rather than throwing away damaged fit test adapters, consider donating them to our fit testing workshops. We strive to make our fit testing workshops as realistic as possible. Incorporating damaged along with good fit testing adapters can provide a valuable training experience. If you wish to send a damaged fit test adapter or a damaged facepiece with unusual or difficult to find leakage for our respirator inspection workshops, send us an email at info@DrMcKay.com and we'll provide shipping information.

Undamaged fit test adapters are also needed. On average, we lose one (1) fit test adapter every workshop due to breakage, poor adapter design, improper student use and other causes.

Respirator Training Courses:

Dr. McKay and the University of Cincinnati is pleased to announce the following programs on Respiratory Protection and Fit Testing to your staff. They are:

Overview of Respiratory Protection:
http://www.drmckay.com/rtc-overview.shtml
April 20, 2021 **(Registration Closed)**
October 19, 2021 space available

Fit Testing Workshop (2-day):
http://www.drmckay.com/rtc-workshop.shtml
April 21-22, 2021 **(Registration Closed)**
October 20-21, 2021 space available

Respirator Selection & Cartridge Change Out Schedule Workshop.
http://www.drmckay.com/rtc-resp_selection.shtml
May 18-19, 2021 **(Registration Closed)**

Fit Testing Refresher & Advanced Topics
http://www.drmckay.com/rtc-resp-refresher-advanced.shtml
May 20, 2021 **(Registration Closed)**

Fit Testing Workshop Quantitative (1-day):
http://www.drmckay.com/rtc-workshop1day.shtml
Onsite only

Respirator Selection & Change Out Schedules

This workshop provides guidance on respirator selection and the development of OSHA compliant change out schedules for respirator cartridges. A combination of lecture with practice problem sessions is used. The course is designed to teach students how to select a respirator based on workplace conditions (exposure level, type of contaminant, length of time to be worn, etc.). The selection process goes beyond the typical recommendation to "use a NIOSH approved air purifying respirator". Students will learn how to select a specific respirator as well as a specific filter/cartridge (when appropriate). More than a dozen guidelines for development of an OSHA compliant cartridge change out policy will also be taught, including common computer models and how to use them.

Partial Listing of Topics

Respirator Selection

* Review of facepiece definitions and modes of operation.
* Practical and theoretical basis for respirator selection based upon:
  Assigned Protection Factors (APF)
  - MUC's, HR's, IDLH, etc.
* OSHA guidelines for respirator selection.
  - IDLH and non-IDLH atmospheres.
* Selection steps and information gathering procedures.
* Minimum respiratory protection versus practical alternatives.
* Filter selection issues
  - How to select an N, R, or P filter.
  - Why filter selection is influenced by exposures below the exposure limit.
  - How to choose a 95 versus 100 filter.
* Practical methods for handling unknown concentrations without defaulting to an SCBA.
* Calculating MUC's for mixtures.
* Saturated Vapor Concentrations (SVC's) and selection concerns.
* When a particulate filter may be needed for organic solvents.
* Equilibrium Vapor Concentrations.
* Selection Workshop
  - Practical problems and solutions.

Respirator Program Administrator Training

Attend at least four days of respirator training from three different training categories and earn a certificate for Respirator Program Administrators.

This program can be given onsite.

For additional information, email us at info@DrMcKay.com

Development of Cartridge Change Out Schedules

* OSHA recommendations for a change out policy.
* Factors that affect cartridge service life.
* Learn how to develop an OSHA compliant change out schedule.
* Understanding the breakthrough curve.
* Common methods used to define breakthrough.
* What level of breakthrough should be used?
* Work rate tables.
* Effect of high relative humidity.
* Methods for determining service life (use, limitations, and practice problems)
  - OSHA recommendations
  - Rules of thumb
  - Using laboratory data
  - Using math models
  - Using computer (software) models
  - Cartridge testing methods (3 methods) Combining methods
* Learn how to develop a change schedule when computer models are not available.
* Recommendations for mixtures:
  - OSHA compliance method
  - mole fraction method
  - multi vapor model
* How to confirm your change-out schedule.
* Storage and migration concerns.
* Immediate Breakthrough Upon Reuse (IBUR) concepts

Gain confidence your current procedures are correct! Former students have found this information to be extremely valuable.

Share Your Respirator Experience

Here's an opportunity to contribute your knowledge and experience to others. If you have an interesting respirator selection or other challenging respirator problem (and solution), please submit it to info@DrMcKay.com. I may use your real-life problem to help train students in our graduate and continuing education programs in respiratory protection. This transfer of information will benefit others, maybe even your children or grandchildren.

Fit Testing Workshop:

This two (2) day workshop provides comprehensive lecture and "hands-on" training for students who need to learn how to conduct an OSHA accepted qualitative or quantitative respirator fit test. Students will have an opportunity to fit test a variety of different style facepieces, including filtering facepieces, half, & full. A combination of lecture and "hands-on" testing in the presence of a trained and experienced instructors will be used to help participants learn how to conduct respirator fit testing to satisfy regulatory requirements. Hands-on fit testing will include qualitative and quantitative methods. The following types of fit testing equipment will be available: Saccharin (sweetener) and Bitrex (bitter) qualitative fit test kits using squeeze-bulb nebulizers. Quantitative fit testing with the TSI PortaCount, AccuFIT 9000, and the OHD QuantiFit. Class size will be limited to ensure a favorable faculty to student ratio. Students will learn how to set-up, operate, maintain, troubleshoot, analyze, and interpret fit test results. Where appropriate, students will learn how to calibrate testing equipment and record results. All course materials, supplies, equipment, and reference manuals will be provided.

Students will also disassemble, reassemble, and inspect respirators for common problems. The workbook alone is a valuable reference for solving fit testing problems in the future.

This course uses a combination of lecture and small practicum groups to ensure students have ample time to practice and learn fit testing techniques. The second day provides students sufficient time to concentrate on the particular methods of interest to them. The "Hands-On" approach is emphasized in this course. Students will have the opportunity to fit test several different make and model respirators. The fit testing workshop provides an opportunity to see and experience many different types of commonly used fit testing methods (qualitative and quantitative).

Individuals who plan to attend the fit testing workshop, but have little or no experience with respiratory protection should take our 1-day "Overview" class, routinely offered before the fit testing workshop. A substantial discount is given when both courses are taken.

Dr. McKay is the past chair of the ANSI Z88.10 Respirator Fit Testing sub-committee, a voting member of the full ANSI Z88 Respiratory Protection Committee, the AIHA Respiratory Protection Committee, and others.

Fit Testing Refresher & Advanced Topics:
This 1-day course is specifically designed for the person who has been conducting fit tests, but has not had formal training or needs a review. This course reviews OSHA fit testing requirements and helps the operator understand **why poorly fitting respirators pass fit testing and why good fitting respirators fail**. It also provides an opportunity to discuss advanced topics not covered during a typical 2-day fit testing workshop due to time limitations. This course is also valuable for respirator program administrators who need a better understanding of fit testing procedures and assurance that their fit testing program is being run properly. The emphasis of this course is on quantitative fit testing, although many of the concepts are applicable to all fit test methods.

Partial Listing of Topics
Review of fit test procedures
- Facial hair: issues & solutions
- Selection process
- Comfort assessment
- Interference with PPE

Establishing pass/fail criteria
Interpretation of fit test results
Why user seal checks fail to detect leakage
Why user seal checks create leaks not present
Proper use of fit test adapters
Selecting sample probe location
Why leaking respirators pass fit testing
Why good fitting respirators fail fit testing
What does a high fit factor really mean?
Wear time & non wear time issues
- Understanding fit factor vs protection

When is quantitative fit testing required?
Opportunity to get answers to your questions

This course can also be given on-site.

Overview of Respiratory Protection:
This one day course provides a practical overview of respirators, standards, guidelines, use, and limitations of commonly used air purifying respirators. This class also provides an excellent overview of the OSHA Respirator Standard. Little or no prior formal training is required. The morning session includes lectures on the types and use of respirators and basic respirator selection procedures using APFs and MUCs. The advantages and disadvantages of different respirator facepieces, filters (N, R, & P), cartridges, PAPR's, and the physiologic effects of wearing a respirator will also be discussed. Respirator standards and program requirements will be reviewed to help the student comply with OSHA regulations. Discussion of qualitative and quantitative fit testing, user seal checks, worker training, and respirator medical clearance requirements will be provided. This course is essential for those individuals who oversee respirator users in their work place or new to respiratory protection.

Respirator Training at Your Location:
A variety of respirator training programs are available on-site. Courses available include:
* Fit Testing Refresher & Advanced Topics
* How to Develop a Cartridge Change Out Schedule (1 day)
* Respirator Selection (1 to 1.5 days)
* Fit Testing for Health Care Professionals (1 day)
* Basics of a Respiratory Protection Program (2 days)
* Overview of Respiratory Protection (1 day)
* Respirator Fit Testing: Quantitative (1 or 2 days)
* Respirator Fit Testing: Qualitative (1day)
* Fit Testing at your workplace. Not a course, but a hands-on program with your staff and equipment.

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Dr. McKay has approximately 40 years of national and international experience in all areas of respiratory protection including **research, teaching, clinical practice, peer reviewed publications, and consultation** as a faculty member at the University of Cincinnati. Dr. McKay is the past chair of ANSI/AIHA Z88.10, the committee responsible for "Respirator Fit Test Methods" and a member of ANSI/ASSE Z88.2-2015 which published the

"American National Standard Practices for Respiratory Protection. Respirator committee assignments include the American Industrial Hygiene Association's Respiratory Protection committee. He has conducted respirator fit testing, training, and consultation services for governmental agencies, including OSHA, NIOSH, NPPTL, CDC, private industry, and respirator manufacturers. He's developed more than a dozen different continuing education courses on respiratory protection, which include fit testing, respirator selection, cartridge change out, program administration, filter penetration, protection factors, and other topics.

Dr. McKay does not receive any public or private funding for this educational service. The opinions in this newsletter are those of Dr. McKay and not the University of Cincinnati.

For information about **QualFit** Software for qualitative respirator fit testing with sweet and/or bitter agents, go to www.QualFit.net

What is **QualFit** software?
12 minutes
https://youtu.be/RwdMfrQXdTY

Basic Operation of **QualFit** Software:
18 minutes
https://youtu.be/vfwfuVOkAKw

Comprehensive Fit Test Training Video
54 minutes
https://youtu.be/FxpVsm3OhLY

Respirator Fit Testing Errors and Solutions - new video (21 minutes)
https://youtu.be/0RsQEeOcS7o

Fit testing errors can cause poorly fitting respirators to pass a fit test. These common mistakes and solutions are explained. Examples include improper squeezing of the nebulizer bulb, excessive tilting, incorrect direction, skipping exercises, incorrect length of time, etc. Solutions for each of these errors are provided.